



JUL 9 1990

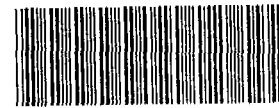
## INTEROFFICE CORRESPONDENCE

Date: July 6, 1990 RDL-1-90

To: Distribution

From: *RLD* R. D. Lindberg, EMAD, Bldg. T130B, x5963

Subject: REVIEW OF EPA'S ALLEGED NEW HAZARDOUS SUBSTANCE SITE NEAR SW-80 AND SUMMARY OF THE 6/21/90 FIELD TRIP WITH PATTY CORBETTA OF EPA



000025434

Introduction

This report is written to document the EG&G response to an issue raised by EPA alleging the discovery of a new hazardous substance site near surface water stations SW-80 and SW-104. This allegation originated with the 2/7/90 letter from Robert Duprey of EPA to Robert Nelson of DOE. The Duprey letter transmits EPA comments on the Draft Background Geochemical Characterization Report.

The EPA Issue

Under "Specific Comments 2" entitled "Potential Contamination in Surface Water Stations SW-104 & SW-80" the EPA reviewer argues that these two sampling stations drain a common area and have very different chemistry than the other 7 background stations. The reviewer compares the water and sediment chemistry in Tables A and B (copies attached) and argues that the metal and radiochemistry concentrations are much higher at these two stations than at the other seven.

The EPA reviewer concludes that: (1) "...stations SW-104 and SW-80 are not representative of a relatively undisturbed background for the Rocky Flats plant"; (2) The data suggests "...some kind of subsurface contamination...upstream of the two springs"; (3) The two stations should not be used for background characterization because they are "anomalous sampling sites".

The EG&G Interpretation

The EG&G interpretation of this chemical data is quite different from that of the EPA reviewer and will be outlined in the following paragraphs. The EG&G viewpoint was presented to Martin Hessmark of EPA during a 6/20/90 conference call involving: Tom Greengard, Mike Arndt, Pete Folger, Ralph Lindberg and Mr. Hessmark. This was followed up with an explanation of the chemistry to Ms. Patty Corbetta of EPA during a 6/21/90 field trip to show her the SW-80 and SW-104 sample sites.

Distribution  
RDL-1-90  
July 6, 1990  
Page 2

Please refer to the attached xerox copies of EPA Tables A and B to better understand the following EG&G interpretation of the data.

The dissolved water chemistry on Tables A and B does not indicate any obvious difference in either trace metal or radiochemistry concentrations between SW-80/SW-104 and the other 7 background stations. In fact, most of the data are below the respective reporting limits for the various analytes.

The sediment radiochemistry concentrations shown on Table B are of similar magnitude for both SW-80/SW-104 and the other 7 stations. Actually, the SW-80/SW-104 concentrations tend to be lower than the maximum concentrations found at the 7 background stations.

The total metals and total radiochemistry data appear different between SW-80/SW-104 and the other 7 stations only because of the huge difference in total suspended solids (TSS). Note that TSS in the SW-80 sample is 4200 mg/L, with 340 mg/L in SW-104, while the maximum TSS value at the other 7 stream water stations was only 18 mg/L during this time period. Because minerals and manmade chemicals in the solid phase have a finite solubility in water, and because many of these solubilities are very low, most surface and ground water systems tend to be low in total dissolved solids (typically less than 300 mg/L TDS for RFP waters). Therefore the analysis of a solid phase often results in astronomically large concentrations of a given analyte in comparison to the limited solubility of that analyte in a natural water.

When comparing "total analyses" of water samples, i.e. analyses of unfiltered water samples, it is essential to examine the amount of suspended solids (TSS) that was presumably analyzed along with the dissolved fraction. In the professional opinion of the writer, it is best to "standardize" total analyses of natural waters on the basis of their TSS content prior to attempting any comparison of total concentrations. One way to do this is to divide all the other analyte concentrations in each water sample by its TSS value in mg/L. This essentially standardizes the concentrations to a unit TSS of 1 mg/L.

It is widely accepted that many trace metals and some radiochemistry analytes like Pu tend to accumulate in or on naturally occurring solids like ferric oxyhydroxides through the processes of adsorption and coprecipitation. Again this explains why the total metal and total radiochemistry results of Tables A and B tend to be proportional to the TSS content of the water.

Distribution  
RDL-1-90  
July 6, 1990  
Page 3

Stations SW-80 and SW-104 are springs with low flow volumes and thus differ from the other 7 stations which are located on streams. The streams presumably contained larger volumes of flowing water at the time of sampling. Thus any sediment stirred up by sampling at the stream sites may have rapidly dissipated.

Field inspection of stations SW-80 and SW-104 indicates that their TSS values were probably artificially high because there are no "spring boxes" to sample from at these natural seeps. The low volume of water flowing from these sites is not muddy when undisturbed. However, the field samplers probably had to use a shovel to dig temporary basins in the black, organic-rich mud in order to collect a sufficient sample volume for analysis. The writer believes that the field crew simply collected the "muddy" disturbed water rather than returning to sample the site later in the day after the water had time to clear up.

A review of TSS data for station SW-104 (in the Weston database) shows erratic TSS values between .5 mg/L on 11/20/89 and 3000 mg/L on 7/14/90. TSS data for SW-80 varied between 180 mg/L on 10/13/89 and a high of 46000 mg/L on 8/10/89. Assuming that this TSS variation is predominantly the result of inconsistent sampling technique we will review the sampling SOP and inform the field samplers of the sampling problem.

### Conclusions

In conclusion EG&G believes that this EPA issue of possible buried contamination near SW-80 and SW-104 is a false alarm. We have no evidence to indicate that these two stations are not representative of "relatively undisturbed background for the Rocky Flats plant" and we will continue to use these stations in the background characterization.

### Summary of the Corbetta Field Trip

About 3 P.M. on 6/21/90 Pete Folger, Tom Greengard, Mike Arndt and Ralph Lindberg drove out with Patty Corbetta to examine surface water stations SW-80 and SW-104. Lindberg explained EG&G's interpretation of the chemistry data as presented in the previous paragraphs. We walked over both sites and saw no visual evidence of past dumping practices at EPA's alleged new hazardous substance site. Both stations are low flow, natural springs or seeps with abundant cattails and organic-rich soil.

Distribution  
RDL-1-90  
July 6, 1990  
Page 4

After viewing SW-80 and SW-104, Corbetta, Lindberg and Folger walked the ridge about 500 feet NW of SW-80 to examine the two dozer scars visible on air photos. Corbetta thought that this area might be a possible former RFP dumping site. Folger and Lindberg presented the viewpoint that there was no evidence of dumping and the two shallow dozer scars were more probably the result of prospecting for gravel deposits.

Examination of the EPA prepared photo atlas of RFP by Lindberg after the field trip indicates that the dozer scars were present before 7/2/55, but there was probably never an access road to connect them to RFP. Hence no haulage road existed to allow systematic dumping, although a primitive road did pass below the base of the ridge. Apparently, the two scars were made by "walking" a bulldozer to their locations.

Corbetta mentioned that she might have to designate the area as a new SWMU and initiate further investigations. Folger and Lindberg expressed the view that there is presently no evidence of waste dumping at the site so it is premature to designate a new SWMU. We offered to be proactive and to collect soil samples from the two trenches for analysis with the results to be made available to EPA as quickly as possible. If the soil analyses are comparable to background soils we might forestall the designation of a new SWMU and save the cost associated with an unnecessary investigation.

After leaving the dozer scars, Corbetta requested a visit to SWMU 209 which is further east and south of Woman Creek. We spent about 20 minutes walking and driving at 209 and then returned to the plant between 4:30 and 4:45 P.M.

laa

Attachment:  
As Stated

Distribution  
M.B. Arndt  
T.C. Greengard

cc:  
W.S. Busby            G.L. Underberg  
P.F. Folger  
J.W. Langman

TABLE A. COMPARISON OF ANALYTE DATA FOR NINE SURFACE WATER QUALITY STATIONS  
(Values in milligrams/liter or kilogram, except pH)

LOCATION	PARAMETER	Al	As	Ba	Be	Cd	Cs	Cr	Co	Cu	Fe	Pb	Mn	Mo	Ni	Ag	Sn	V	pH	TSS
ANALYTE																				
Round 1- Total Metals																				
Seven Stations	Limit	<.2	<.01	<.2	<.005	<.005	<1	<.01	<.05	<.025	*	<.005	<.015	<.1	<.04	<.01	<.1	<.05	*	<5
	(N)	6	7	7	7	7	7	7	7	7	7	7	3	7	7	6	7	7	7	3
	Maximum	1.0								2.3			.375			.011			7.25	18
	X									.49									7.6	
S																				
SW-104																				
Value																				
SW-80																				
Value																				
Round 2- Total Metals																				
Six Stations (04 DRY)	Limit	<.2	<.01	<.2	<.005	<.005	<1	<.01	<.05	<.025	*	<.01	*	*	<.04	<.01	<.1	<.05	<.05	
	(N)	1	6	6	6	6	6	6	6	6	6	5	6	6	6	6	6	6	6	
	Maximum	4.9								5.5										
	.019	.216	.018																	NO DATA
X																				
S																				
SW-104																				
Value																				
SW-80																				
Value																				
Round 1- Dissolved Metals																				
Seven Stations	Limit	<.2	<.01	<.2	<.005	<.005	<1	<.01	<.05	<.025	<.1	<.005	<.015	<.1	<.04	<.01	<.1	<.05	*	
	(N)	6	7	7	7	7	7	7	7	7	6	6	4	7	7	7	7	7	7	
	Maximum	.37								1.3		.006	.35						7.25	200
	X																		7.6	101
S																				
SW-104																				
Value																				
SW-80																				
Value																				
NO ROUND 2 DISSOLVED METALS																				

\* Indicates that all values were above detection; X and S calculated.  
(N) below Limit indicates number of samples less than this detection value

TABLE B. COMPARISON OF RADIOCHEMISTRY ANALYTE DATA FOR NINE SURFACE WATER QUALITY STATIONS  
(Values in picocuries/gram or liter)

LOCATION	PARAMETER	Gross Al	Gross Be	U233	U235	U238	SR89.90	Plut239	Amer241	Cs137	Tr1t	Ra226	Ra228
ANALYTE (Values in picocuries/gram or liter)													
Total Water Sample- Round 1													
Seven Stations	Limit	<3	<3	<3	<2	<2	<5	<.02	<.03	<.6	<150	NR	NR
	(N)	6	5	5	7	4	6	7	7	7	6	6	7
	Maximum	6	7.5	.9		.4	1.25				200	<.2	
SW-104	Value	25	22	.5	<.2	.7	1.1	.08	<.03	<.6	<150	.7	NR
SW-80	Value	250	200	<.3	<.2	.3	1.1	1.0	.10	12	190	5.5	11
Total Water Sample- Round 2													
Six Stations (04 DRY)	Limit	<4	<3	<2	<.1	<.2	<.4	<.01	<.02	<.8	<230	NR	NR
	(N)	6	3	1	6	2	5	5	6	6	5	6	6
	Maximum		7.0	.7		.4	.8	.02			550		
SW-104	Value	78	58	.5	<.1	.3	<.4	.08	<.02	<.8	<230	1.4	NR
SW-80	Value	DRY											NR- Not reported
Dissolved Water Sample- Round 1													
Seven Stations	Limit	<4	<3	<3	<.2	<.2	<.5	<.02	<.03	<.6	NR	NR	NR
	(N)	7	4	3	7	3	6	7	7	7	7	7	7
	Maximum		5.5	.8		.6	.95						
SW-104	Value	<4	<3	2.6	.3	1.7	.8	<.02	<.03	<.6	NR	NR	NR
SW-80	Value	<4	<3	<.3	<.2	<.2	<.5	<.02	<.03	<.6	NR	NR	NR
Sediment Total Samples													
Seven Stations	Limit	<13	*	*	<.1	*	<.7	<.02	<.02	<.1	<.15	*	*
	(N)	2	7	7	7	7	6	6	7	6	1	7	7
	Maximum	40	40	1.2		1.3	.8	.08		.4	.32	1.0	2.1
SD-19(104)	Value	39	29	.9	<.1	1.1	<.7	.04	<.02	1.4	.18	.8	1.0
SD-18(80)	Value	35	23	.7	<.1	.5	<.7	.03	<.02	.4	<.15	.8	1.2

\* Indicates that all values were above detection; X and s calculated.